CLAIMS:

1. Sputtering chamber having at least one sputtering source with a new sputter surface at least approximately symmetrical with respect to a central axis, further having a substrate carrier which is rotatable in a driven manner about a substrate carrier axis, the central axis and the substrate carrier axis being oblique with respect to one another,
characterized in that the sputtering source is a magnetron sputtering source.

2. Chamber according to Claim 1,
characterized in that the new sputter surface is essentially rotationally symmetrical with respect to the central axis.

3. Chamber according to one of Claims 1 or 2,
characterized in that the central axis and the substrate carrier axis intersect at least approximately.

4. Chamber according to one of Claims 1 to 3,
characterized in that the following applies with respect to the angle β between the central axis and the substrate carrier axis,

$$30^\circ \leq \beta \leq 60^\circ,$$

preferably

$$40^\circ \leq \beta \leq 55^\circ,$$

particularly preferably

$$43^\circ \leq \beta \leq 50^\circ,$$

particularly

$$\beta \approx 45^\circ.$$

5. Chamber according to one of Claims 1 to 4, characterized in that the central axis and the substrate carrier axis have their smallest spacing at least approximately on a surface, which is to be sputter coated, of a substrate applied to the substrate carrier.

6. Chamber according to one of Claims 1 to 5, characterized in that it can be arbitrarily positioned in the space, preferably in that the substrate carrier is positioned at least approximately horizontally.

7. Chamber according to one of Claims 1 to 6, characterized in that the projection of the new sputter surface onto a plane perpendicularly to the central axis is larger than the surface, which is to be sputter-coated and is projected on the same plane, of at least one substrate receivable on the substrate carrier.

8. Chamber according to one of Claims 1 to 7, characterized in that at least two of the above-mentioned sputtering sources are provided and can simultaneously affect a substrate.

9. Chamber according to one of Claims 1 to 8, characterized in that the sputtering source has a new sputter surface which is essentially rotationally symmetrical to the central axis, and, in the operation, generates in the sputtering surface at least one erosion trough which extends in a circular shape around the central axis, in which case, the following applies to the radius r_T of the site of the largest erosion depth of the radially outermost erosion trough and to the distance D of the site of the smallest spacing of the central axis and the substrate carrier axis from the sputtering surface,

$$1/4 \leq r_T / D \leq 2/3.$$

10. Chamber according to one of Claims 1 to 9, characterized in that the new sputter surface is essentially rotationally symmetrical with respect to the central axis, and the following applies to the sputtering surface diameter ϕ_T and the distance D between the sputtering surface and the site of the smallest spacing of the central axis and the substrate carrier axis - preferably on the substrate surface to be coated,

$$3/4 \leq \phi_T / D \leq 2,$$

preferably

$$\phi_T \approx 1.2 \text{ D}.$$

11. Chamber according to one of Claims 1 to 10, characterized in that the substrate carrier is constructed for the centered receiving of one or several substrates and, for this

purpose, has a substrate receiving surface centered with respect to the substrate carrier axis, in which case, the following applies to the diameter of the receiving surface ϕ_S and to the distance D of the site of the smallest spacing of the central axis and the substrate carrier axis - preferably situated on the substrate surface to be coated - from the new sputter surface,

$$\phi_S / D \leq 1.8.$$

12. Chamber according to one of Claims 1 to 11, characterized in that the new sputter surface is rotationally symmetrical with respect to the central axis and the substrate carrier is constructed for the centered receiving of one or several substrates and, for this purpose, has a receiving surface centered with respect to the substrate carrier axis, in which case the following applies with respect to the diameter of the substrate receiving surface ϕ_S and the diameter ϕ_T of the new sputter surface,

$$0.5 \leq \phi_S / \phi_T \leq 2.4.$$

preferably

$$1 \leq \phi_S / \phi_T \leq 2.4.$$

13. Chamber according to one of Claims 1 to 12, characterized in that the substrate carrier has a centered receiving surface for at least one substrate with a diameter ϕ_S to which the following applies,

$$50 \text{ mm} \leq \phi_S \leq 400 \text{ mm},$$

preferably

$$50 \text{ mm} \leq \phi_S \leq 300 \text{ mm},$$

in that the diameter ϕ_S preferably amounts to 64 mm or 120 mm or 160 mm to 240 mm.

14. Chamber according to one of Claims 1 to 13, characterized in that the substrate carrier is linearly displaceable in a driven manner in the direction of the substrate carrier axis.

15. Chamber according to one of Claims 1 to 14, characterized in that, in the machining position, a substrate arranged on the substrate carrier or the substrate carrier itself together with the sputtering surface bounds a process space on two sides.

16. Vacuum treatment system having a least one sputtering chamber according to one of Claims 1 to 16,
characterized in that the sputtering chamber is connected by way of one or several transport chambers with at least one lock chamber, in which substrates are transferred from the surroundings into a vacuum and are transferred out of the vacuum into the surroundings.

z 17. Vacuum transport chamber for disk-shaped substrates, characterized by

- a base plate structure (45) which, by means of its interior surface, borders the interior (3) of the chamber on one side,

- a covering structure which is situated essentially in parallel opposite the interior surface of the base plate structure and which has at least two substrate passage openings which are adapted to the substrate disk surface,

- a transport device which is rotationally movable in a driven manner about an axis of rotation perpendicular to the base plate structure, in the chamber, with at least one substrate receiving device which, by means of the rotating movement can be brought into an alignment in each case with one of the openings, a controlled sealing arrangement establishing the edge of at least one of the openings with the substrate holding device brought into an alignment with it and a substrate provided thereon.

18. Transport chamber according to Claim 17, characterized in that one of the openings is equipped with a cover, which can preferably be closed in a motor-driven manner with respect to the surroundings, the cover and the workpiece receiving device brought into an alignment with this opening and a workpiece on this receiving device forming interior-side and exterior-side lock valves for a lock chamber integrated at this opening.

19. Chamber according to Claim 18, characterized in that the cover is indented toward the chamber for reducing the lock volume to be pumped down.

20. Chamber according to one of Claims 17 to 19, characterized in that the sealing arrangement has at least one seal which extends on the interior side of the chamber around an opening and can be pneumatically or hydraulically operated.

21. Chamber according to Claim 18, characterized in that the sealing arrangement has a seal which surrounds on the chamber side an opening provided with the cover and is pneumatically or hydraulically operable, and an additional surrounding sealing arrangement is provided which is opposite this seal on the interior basic plate structure surface and can preferably be operated pneumatically or hydraulically, which two sealing arrangements accommodate in a sealing manner between one another the workpiece receiving device aligned with this opening.

22. Chamber according to one of Claims 17 to 21, characterized in that the workpiece receiving device has at least one opening, preferably a central opening.

23. Chamber according to Claim 19, characterized in that the cover is indented so far that, in the closed state, its interior surface just barely does not touch a

workpiece disk on the workpiece receiving device aligned with the mentioned opening.

24. Transport chamber according to one of Claims 17 to 23, characterized in that two of the mentioned openings are provided, the axis of rotation of the transport device is arranged offset with respect to a connection line of the opening centers, and the workpiece receiving device, from the alignment with one of the openings to an alignment with the other of the openings, carries out a swivelling movement about the axis of rotation of not more than 120°, preferably nor more than 90°.

25. Transport chamber according to Claim 24, characterized in that the openings on the covering structure are separated essentially only to such an extent that the flanging-on of a vacuum treatment chamber can take place in-between.

26. Transport chamber according to one of Claims 24 or 25, characterized in that the axis of rotation of the transport device is flanged laterally onto the base plate structure.

27. Transport chamber according to one of Claims 17 to 26, characterized in that a workpiece lifting drive and/or a workpiece rotating drive is mounted at at least one of the openings, opposite the covering structure and preferably in a centered manner with respect to this opening, on the base plate

structure.

28. Transport chamber according to Claim 27, characterized in that the workpiece receiving device has a central part which can be lifted perpendicularly to the interior base plate structure surface off the remaining transport device part connected with the axis of rotation, with which central part the lift and/or rotating drive is then brought in a controlled manner into an operative connection when the workpiece receiving device is aligned with the one opening which has the above-mentioned drive.

29. Vacuum treatment system having a vacuum transport chamber according to one of Claims 17 to 28,
characterized in that a vacuum treatment station is flanged at at least one of the opening onto the covering structure of the vacuum transport chamber.

30. System according to Claim 29,
characterized in that the station is a sputtering source according to one of Claims 1 to 15.

31. System according to Claim 30, having a vacuum transport chamber according to Claim 18,
characterized in that two of the openings are provided on the transport chamber and the central axis of the sputtering source

on one of the two openings is sloped away from the other opening, and in that preferably a motor drive for a cover is arranged at the other opening on a connection flange for the source.

32. System according to Claim 31, characterized in that the cover is swivellably disposed on a swivel bearing with a swivelling axis in parallel with respect to the covering structure, which swivelling axis is arranged between the openings and preferably the source is also swivellably disposed about a swivelling axis in parallel to the covering structure, which swivelling axis, with respect to the opening provided with the source, is situated opposite the swivelling axis of the cover.

33. Method for producing coated data storage disks or wafers,
characterized in that at least one coating step is carried out by an oblique-angled magnetron sputtering on to the rotating substrate.

34. Use of the sputtering chamber according to one of Claims 1 to 15, of the transport chamber according to one of Claims 17 to 28, of the system according to one of Claims 16 and 29 to 32 and of the method according to Claim 33 for the coating of optical data storage substrates, of masters or of piezoelectric wafers or of wafers for the semiconductor

production.